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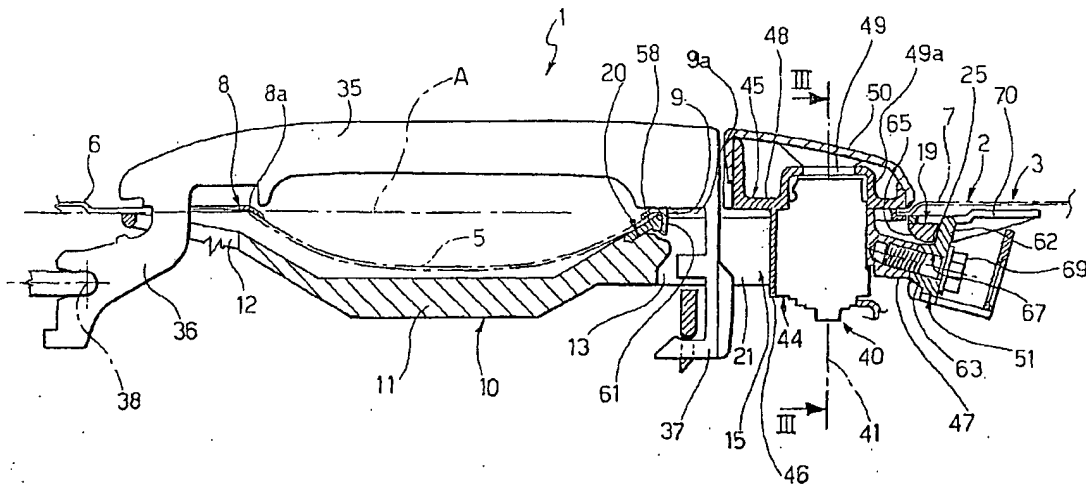
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(54) **Vehicle door handle**

(57) A handle (1) for a vehicle door (2); the handle has a frame (10), which is fitted integrally inside the door (2) and has an end portion at least partly housing a lock cylinder (40); the lock cylinder (40) provides for releas-

ing and engaging a lock on the door (2) using a key, and is supported by a body (51), which is made of stronger material than the frame (10), is connected integrally to the frame (10), and at least partly surrounds the end portion (13).

**FIG.1**



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## Description

[0001] The present invention relates to a vehicle door handle, and in particular to a handle comprising a frame, which is housed inside and connected integrally to the door, and is formed in one piece from plastic material, in particular to reduce the weight and cost of the handle.

[0002] Known frames comprise a hollow end portion housing a lock cylinder fitted directly to the frame to release and engage a lock on the door by means of a key.

[0003] Known handles of the type described above are unsatisfactory by failing to ensure against break-in and theft of the vehicle.

[0004] That is, the connection of the lock cylinder to a known frame of the type described above is fairly weak, so that, by forcing the handle from outside the vehicle by means of a tool, such as a screwdriver or lever, the lock cylinder can be rotated with respect to the frame or withdrawn fairly easily to release the lock without the key.

[0005] It is an object of the present invention to provide a vehicle door handle designed to solve the aforementioned drawbacks in a straightforward, low-cost manner, while at the same time still being lightweight and cheap to produce.

[0006] According to the present invention, there is provided a handle for a vehicle door; the handle comprising a frame which is housed inside said door and connected integrally to the door; a lock cylinder for receiving a key by which to release and engage a lock on said door; and connecting means for connecting said lock cylinder to said frame; characterized in that said connecting means comprise a first supporting body made of stronger material than said frame, connected integrally to the frame, and supporting said lock cylinder.

[0007] A non-limiting embodiment of the invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic section of a preferred embodiment of the vehicle door handle according to the present invention;

Figure 2 shows a larger-scale view in perspective of a component part of the Figure 1 handle;

Figure 3 shows a schematic section along line III-III in Figure 1;

Figure 4 shows the same view as, and a larger-scale detail, with parts removed for clarity, of Figure 1.

[0008] Number 1 in Figure 1 indicates a handle for a door 2 (shown partly) of a vehicle, in particular a motor vehicle.

[0009] Door 2 comprises an outer body 3, in turn comprising a concave intermediate portion 5, and two portions 6 and 7, which are located on opposite sides of portion 5 in a direction A parallel, in use, to a horizontal longitudinal direction of the vehicle, and have respective

openings 8 and 9.

[0010] The edge of each opening 8, 9 is fitted with an annular sealing member 8a, 9a for ensuring, in use, fluidtight sealing of handle 1 through opening 8, 9.

[0011] With reference to the accompanying drawings, handle 1 is elongated parallel to direction A, and comprises a fastening frame 10, which is located inside door 2, is connected integrally to door 2 in known manner not described in detail, and is formed in one piece from plastic material.

[0012] Frame 10 comprises an intermediate portion 11 facing portion 5; and two hollow, opposite end portions 12 and 13 adjacent to portions 6 and 7 respectively, and of which portion 13 defines a through cavity 15 at opening 9.

[0013] With reference to Figures 1 and 3, portion 13 has a flat annular surface 19 facing body 3 and having a seat 20 formed adjacent to intermediate portion 11, and comprises two facing lateral walls 21, which extend perpendicularly to surface 19 and parallel to direction A, and are connected to each other at the end of frame 10 by a transverse portion 25.

[0014] As shown in Figure 1, handle 1 also comprises a known lever 35 outside door 2, and which has, at the ends, two integral arms 36 and 37 extending through openings 8 and 9 respectively. Arm 36 is fitted to portion 12 to allow lever 35, when operated manually by a user, to rotate, about an axis 38 perpendicular to direction A, between a rest position and a work position in which arm 37 releases, in known manner not shown, a lock (not shown) on door 2.

[0015] With reference to Figures 1, 3 and 4, the lock is released and engaged by means of a known lock cylinder 40 (shown schematically) extending through cavity 15 along an axis 41 perpendicular to direction A and to axis 38, and for receiving a key (not shown).

[0016] Lock cylinder 40 is connected to frame 10 by a connecting assembly 44 comprising a body 45, which is made of stronger material than frame 10, preferably metal, and in turn comprises a tubular portion 46 housing and connected integrally to lock cylinder 40.

[0017] Body 45 also comprises a nut screw 47 projecting from portion 46 and facing portion 25; and a guard wall 48 extending about portion 46 on the outside of door 2. Wall 48 has a hole 49 permitting insertion of the key inside lock cylinder 40, and which is defined by an annular projection 49a defining a shoulder resting axially on lock cylinder 40.

[0018] Body 45 has a cap 50, which clicks onto wall 48.

[0019] With reference to the accompanying drawings, assembly 44 also comprises a supporting body 51 also made of stronger material than frame 10, and preferably of a metal alloy known commercially as "ZAMAK".

[0020] Body 51 comprises a front wall 52, which is interposed between surface 19 and body 3, rests on surface 19 itself, and defines an opening 53 formed at opening 9 and cavity 15 and closed partly by wall 48.

Body 51 also comprises a lateral wall 54, which extends perpendicularly to wall 52, is fitted about portion 13, and rests on walls 21 and portion 25 to retain body 51 to frame 10 angularly about axis 41. Body 51 is retained axially to portion 13 by releasable retaining devices 55 defined, in particular, by two lateral seats 56 (Figure 3) into which click respective elastic appendixes 57 integral with walls 21, and by an end tongue 58 which clicks into seat 20.

[0021] Tongue 58 is retained on portion 7 of body 3 by member 9a, which comprises an appendix 61 extending through opening 53 and engaging tongue 58.

[0022] On the opposite side to tongue 58 in direction A, wall 54 comprises a portion 62, which rests against portion 25 and has an integral projection 63 facing wall 52 and defining, together with wall 52, a seat 65 engaged by portion 25. Projection 63 defines a through hole 67 coaxial with nut screw 47 and fitted through with a screw 69, the end of which is screwed inside nut screw 47 to lock bodies 45 and 51 to each other.

[0023] With reference to Figures 1 and 2, body 51 comprises two plates 70, which are reinforced with ribs, project in diverging directions from the opposite side to tongue 58 to form an extension of wall 52, and are positioned facing and detached from body 3.

[0024] To fit handle 1 to door 2, body 51 is fitted to portion 13 by first inserting portion 25 inside seat 65 and then rotating body 51 anticlockwise, in Figures 1 and 4, to click appendixes 57 inside seats 56, and tongue 58 inside seat 20.

[0025] After positioning frame 10 inside door 2, members 8a, 9a are fitted to the edges of openings 8, 9: appendix 61 is hooked onto body 51; and lever 35 is then fitted to frame 10, working from outside door 2.

[0026] After fitting lock cylinder 40 to body 45, body 45 is inserted through opening 9 into cavity 15; wall 48 is positioned against member 9a to partly close openings 9 and 53; and bodies 45 and 51 are locked to each other by tightening screw 69 from inside door 2.

[0027] In use, bodies 45 and 51 therefore safeguard handle 1 against any attempt to break into the vehicle, by being stronger than frame 10, by supporting lock cylinder 40, and by being locked to each other and to frame 10.

[0028] As such, bodies 45 and 51 prevent lock cylinder 40 from rotating about axis 41 with respect to frame 10, or being extracted from frame 10.

[0029] Walls 52 and 54 protect portion 13 against scratching or breakage using tools such as a screwdriver, punch, pliers or lever; wall 48 acts as a barrier to prevent insertion of such tools through openings 9, 53; and annular projection 49a prevents lock cylinder 40 from being withdrawn axially.

[0030] Any attempt to lever body 51 about axes cross-wise to axis 41 is effectively counteracted by plates 70 coming to rest against body 3.

[0031] The connection comprising screw 69 and nut screw 47 ensures mutual locking of bodies 45 and 51,

is inaccessible from outside door 2, and provides for assembling handle 1 quickly and easily.

[0032] Body 51 is connected to frame 10 quickly by virtue of devices 55, and the resulting connection is both firm and safe.

[0033] Handle 1 is relatively lightweight and cheap to produce, by frame 10 still being made of plastic material, and only bodies 45 and 51 being made of stronger, more expensive materials, and is therefore a good compromise between excessively weak known solutions - featuring plastic frames, with no additional bodies for supporting lock cylinder 40 - and relatively high-cost, heavy solutions in which the frame is made entirely of metal.

[0034] Clearly, changes may be made to handle 1 as described and illustrated herein without, however, departing from the scope of the present invention.

[0035] In particular, bodies 45 and 51 may be formed differently and/or be made of materials other than those described, e.g. aluminium, steel, etc., and stronger with respect to the plastic material of frame 10.

## Claims

1. A handle (1) for a vehicle door (2); the handle comprising a frame (10) which is housed inside said door (2) and connected integrally to the door (2); a lock cylinder (40) for receiving a key by which to release and engage a lock on said door (2); and connecting means (44) for connecting said lock cylinder (40) to said frame (10); **characterized in that** said connecting means (44) comprise a first supporting body (51) made of stronger material than said frame (10), connected integrally to the frame (10), and supporting said lock cylinder (40).
2. A handle as claimed in Claim 1, **characterized in that** said frame (10) comprises an end portion (13) at least partly housing said lock cylinder (40); said first supporting body (51) at least partly surrounding said end portion (13).
3. A handle as claimed in Claim 2, **characterized in that** said door (2) comprises an outer body (3); and **in that** said first supporting body (51) comprises a front wall (52) interposed between said end portion (13) and said outer body (3), and a lateral wall (54) for laterally covering said end portion (13).
4. A handle as claimed in Claim 3, **characterized in that** said lateral wall (54) comprises a projection (63) defining, together with said front wall (52), a seat (65); said seat (65) being engaged by a portion (25) of said frame (10) to retain said first supporting body (51) to the frame (10).
5. A handle as claimed in any one of the foregoing Claims, **characterized in that** said first supporting

body (51) comprises at least one plate (70) projecting from the opposite side to said frame (10) so as to face said outer body (3).

6. A handle as claimed in Claim 5, **characterized in that** said first supporting body (51) comprises two diverging said plates (70). 5
  
7. A handle as claimed in any one of the foregoing Claims, **characterized by** comprising click-on retaining means interposed between said first supporting body (51) and said frame (10). 10
  
8. A handle as claimed in any one of the foregoing Claims, **characterized in that** said material of said first supporting body (51) is a metal alloy. 15
  
9. A handle as claimed in any one of the foregoing Claims, **characterized in that** said connecting means (44) also comprise a second supporting body (45) housing said lock cylinder (40), connected integrally to the lock cylinder (40), and made of stronger material than said frame (10); fastening means (69, 47) being provided to connect said first and said second supporting body (51) (45) integrally to each other. 20  
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10. A handle as claimed in Claim 9, **characterized in that** said fastening means (69, 47) comprise a screw-nut screw connection (69, 47). 30
  
11. A handle as claimed in Claims 4 and 10, **characterized in that** said screw-nut screw connection (69, 47) is associated with said projection (63). 35
  
12. A handle as claimed in any one of Claims 9 to 11, **characterized in that** said first supporting body (51) has a front opening (53) formed at a cavity (15) in said frame (10) housing said lock cylinder (40); said second supporting body (45) comprising a guard wall (48) partly closing said opening (53). 40
  
13. A handle as claimed in Claim 12, **characterized in that** said lock cylinder (40) extends along an axis (41); said guard wall (48) having a hole (49) permitting access to said lock cylinder (40) and defined by an annular portion (49a) resting axially on the lock cylinder (40). 45

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FIG.1

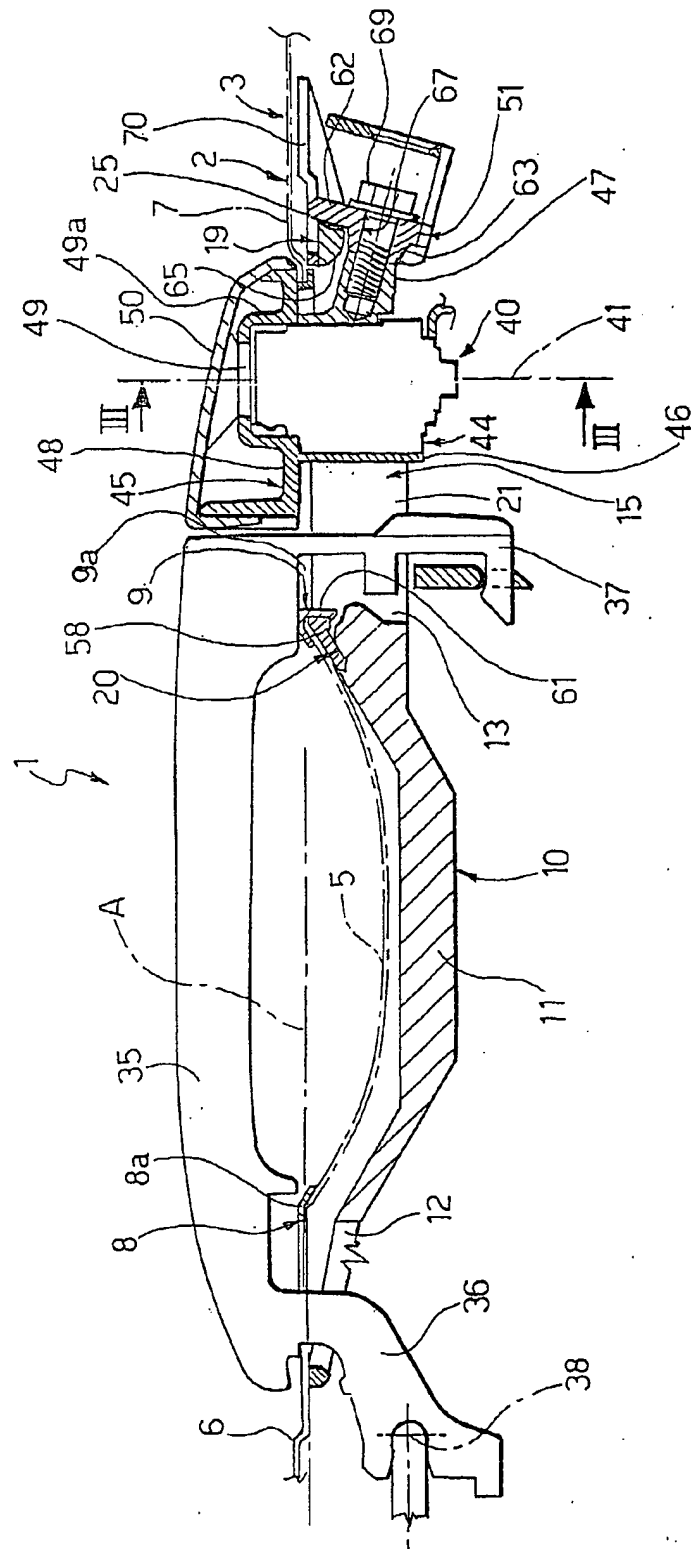


FIG. 4

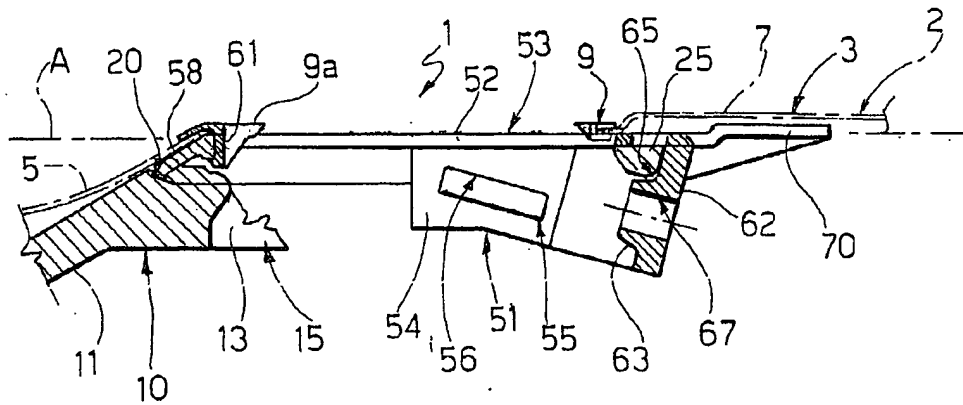


FIG. 2

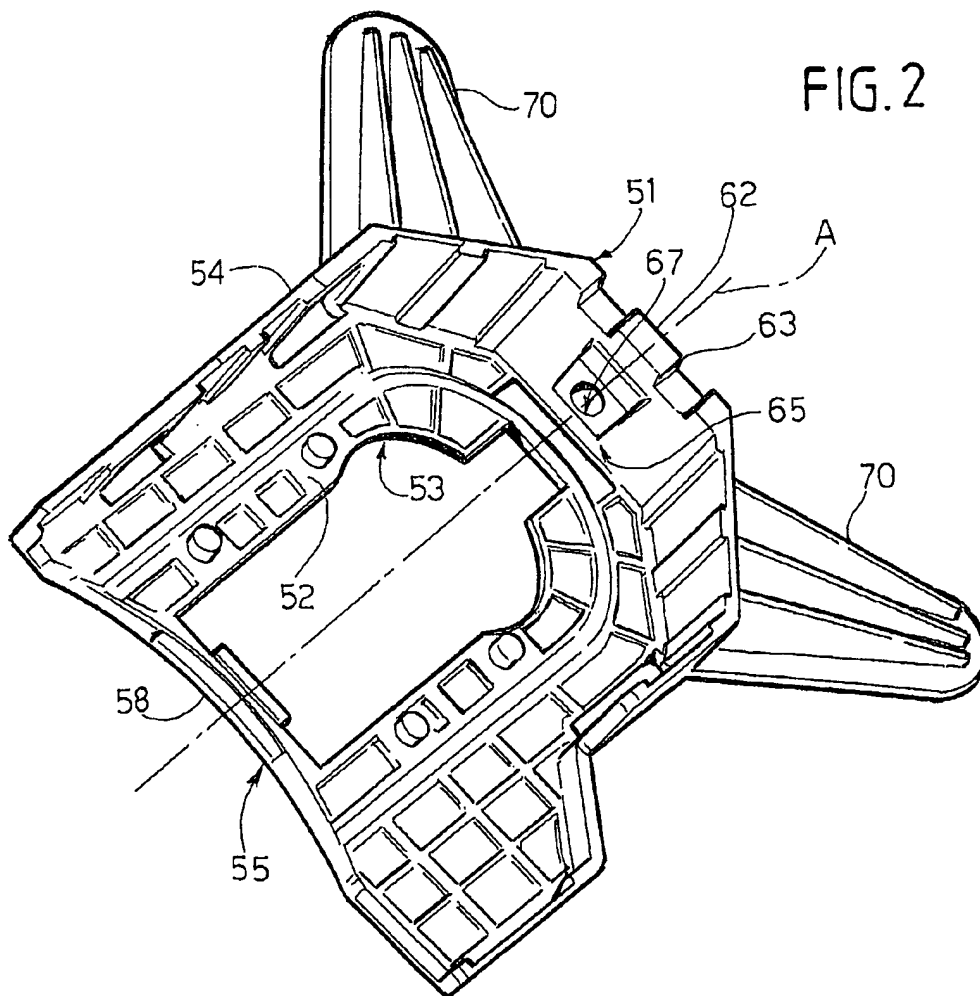
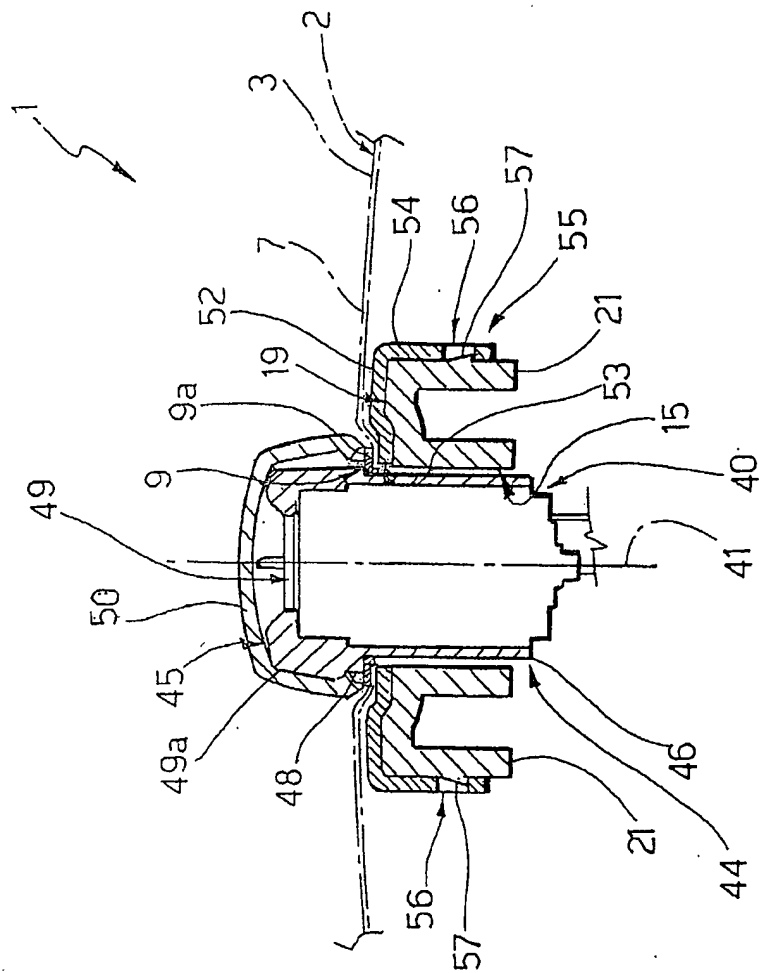


FIG. 3





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Application Number  
EP 01 83 0488

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THE HAGUE		26 November 2001	PEREZ MENDEZ, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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